CLAIMS

What is claimed is.

1. A process of forming an oscillator comprising:

patterning a plurality of spaced-apart stacks on an oscillator member; and

removing at least one of the spaced-apart stacks.

2. The process according to claim 1, before removing, further comprising:

determining a first resonant frequency of the oscillator.

3. The process according to claim 1, before patterning further comprising:

forming a protective layer over the oscillator member.

4. The process according to claim 1, before patterning further comprising:

forming a protective layer over the oscillator member; and

patterning the protective layer.

5. The process according to claim 1, before patterning, further comprising:

forming a protective layer over the oscillator member;

forming an ablative layer over the oscillator member; and

patterning to form a plurality of spaced-apart stacks.

6. The process according to claim 1, before patterning further comprising:

forming a protective layer over the oscillator member, wherein the protective layer is selected from a refractory metal, a refractory metal oxide, a refractory metal silicide, a refractory metal nitride, and combinations thereof.

7. The process according to claim 1, before patterning further comprising:

forming a protective layer over the oscillator member, wherein the protective layer is selected from a silicon-containing composition.

8. The process according to claim 1, wherein removing further comprises:

directing a radiant energy source to at least one of the spaced-apart stacks, wherein the radiant energy source is selected from a laser, an ion beam, and combinations thereof.

9. The process according to claim 1, wherein removing is repeated until an empirical removal pattern is established, further comprising:

determining a second resonant frequency of the oscillator; and

forming the empirical removal pattern upon a second oscillator.

10. The process according to claim 1, wherein removing further comprises:

selecting at least one spaced-apart stack for removal based upon a first resonant frequency of the oscillator member and based upon a respective position of each at least one spaced-apart stack along the oscillator member, under conditions to approach a second resonant frequency.

11. The process according to claim 1, further comprising:

providing the oscillator member, wherein the oscillator member is a beam and wherein the oscillator member has a mass in the range from about 0.1×10^{-7} gram to about 10×10^{-7} gram.

12. The process according to claim 1, wherein patterning further comprises:

forming a plurality of spaced-apart stacks, wherein each of the spaced-apart stacks has a mass in a range from about 0.02 % the mass of the oscillator member to about 2 % the mass of the oscillator member.

13. The process according to claim 1, further comprising:

determining first resonant frequency of the oscillator member; and after removing, further comprising:

determining a second resonant frequency of the oscillator.

14. The process according to claim 1, wherein the oscillator member is oscillated while removing.

15. The process according to claim 1, wherein patterning comprises forming a bulk material on the oscillator member with deposition of a vapor.

13. A process of forming an oscillator comprising:

providing an oscillator member;

determining a first resonant frequency of the oscillator member;

patterning at least one structure on the oscillator member; and

determining a second resonant frequency of the oscillator member.

14. The process according to claim 13, before patterning further comprising:

forming a protective layer over the oscillator member.

15. The process according to claim 13, wherein patterning, further comprising:

directing radiant energy at the oscillator member.

16. The process according to claim 13, wherein patterning, further comprising:

directing radiant energy at the oscillator member; and

removing at least one structure from the oscillator member.

17. The process according to claim 13, wherein patterning, further comprising:

directing radiant energy at the oscillator member; and

precipitating a vapor on the oscillator member.

18. The process according to claim 13, wherein the radiant energy source is selected from a focused ion beam and a laser.

19. The process according to claim 13, wherein patterning further comprises:

continuously monitoring the resonant frequency from the first frequency to the second frequency by vibrating the oscillator member.

20. The process according to claim 13, wherein patterning is repeated to form an empirical spaced-apart stack pattern, further comprising:

determining the second resonant frequency of the oscillator member; and

forming the empirical spaced-apart stack pattern upon a second oscillator member.

21. A micro resonator comprising:

an oscillator member disposed upon an oscillator pedestal; and

at least one structure disposed upon the oscillator member.

22. The micro resonator according to claim 21, wherein the at least one structure comprises:

a pattern of spaced-apart stacks disposed upon the oscillator member, wherein the oscillator member has a mass in a range from about 0.1×10^{-7} gram to about 10×10^{-7} gram.

23. The micro resonator according to claim 22, the spaced-apart stacks further comprising:

a protective layer disposed upon the oscillator member, wherein the protective layer is selected from a refractory metal, a refractory metal oxide, a refractory metal silicide, a refractory metal nitride, and combinations thereof.

24. The micro resonator according to claim 22, the spaced-apart stacks further comprising:

a protective pad selected from aluminum, an aluminum alloy, silver, a silver alloy, indium, an indium alloy.

25. The micro resonator according to claim 22, wherein the oscillator member is made of a material selected from polysilicon, a metal, a metal nitride, a metal oxide, a metal silicide, and combinations thereof.